Claims

[c1] 1. A method of operating an aluminum oxide moisture sensor to measure moisture in a sample gas, where the sensor comprises a pair of electrodes sandwiched about a dielectric, the method comprising:

a) heating the sensor to a first temperature above the sample gas temperature and holding the sensor at said first temperature for a first predetermined period of time;

b) cooling down the sensor to a second lower temperature over a second predetermined period of time;

c) taking plural samples of sensor conductance over a third predetermined period of time at said lower temperature; and

d) determining a rate of adsorption of the moisture and using the rate of adsorption as a measure of moisture in the sample gas.

[c2] 2. The method of claim 1 wherein step c) is carried out by taking about 100 samples of sensor conductance over a period of between about 60 and 90 seconds.

[c3] 3. The method of claim 1 wherein step d) is carried out in part by applying a 10-point moving average filter to said plural samples of sensor conductance to obtain data filtered for noise reduction.

[c4] 4. The method of claim 3 wherein step d) is carried out further

by performing a linear repression on the data filtered for noise reduction to obtain a slope representative of the rate of adsorption.

[c5] 5. The method of claim 2 wherein step d) is carried out in part by applying a 10-point moving average filter to said plural moisture samples to obtain data filtered for noise reduction.

[c6] 6. The method of claim 5 wherein step d) is carried out further by performing a linear repression on the data filtered for noise reduction to obtain a slope representative of the rate of adsorption.

[c7] 7. The method of claim 1 wherein said first predetermined period of time is about 15-30 seconds.

[c8] 8. The method of claim 1 wherein said second predetermined period of time is about 30-50 seconds.

[c9] 9. The method of claim 1 wherein said third predetermined period of time is about 60-90 seconds.

[c10] 10. The method of claim 1 wherein said first predetermined period of time is about 15-30 seconds; said second period of time is about 30-60 seconds; and said third period of time is about 60-90 seconds.

[c11] 11. The method of claim 1 wherein step c) is carried out by taking about 100 samples of sensor conductance over a

period of between about 60 and 90 seconds; and wherein step d) is carried out in part by applying a 10-point moving average filter to said 100 samples of sensor conductance to obtain data filtered for noise reduction.

[c12] 12. The method of claim 7 wherein said first predetermined period of time is about 20 seconds.

[c13] 13. The method of claim 8 wherein said second predetermined period of time is about 40 seconds.

[c14] 14. The method of claim 9 wherein said third predetermined period of time is about 75 seconds.

[c15] 15. The method of claim 1 wherein said first temperature is about 90Â°C and said second lower temperature is about 35Â°C to about 40Â°C.

[c16] 16. A method of operating an aluminum oxide moisture sensor to measure moisture in a sample gas, where the sensor comprises a pair of electrodes sandwiched about a dielectric, and the method comprising:

a) heating the sensor to a first temperature above the sample gas temperature and holding the sensor at said first temperature for a first predetermined period of time;

b) cooling down the sensor to a second lower temperature over a second predetermined period of time;

c) taking plural samples of sensor conductance over a third

predetermined period of time at said second lower temperature; and

d) determining a rate of adsorption of the moisture and using the rate of adsorption as a measure of moisture in the sample gas;

wherein step c) is carried out by taking about 100 samples of sensor conductance, and wherein said third predetermined period of time is about 60 and 90 seconds; and wherein step d) is carried out in part by applying a 10-point moving average filter to said plural samples of sensor conductance to obtain data filtered for noise reduction; and by performing a linear repression on the data filtered for noise reduction to obtain a slope representative of the rate of adsorption.

[c17] 17. The method of claim 16 wherein said first predetermined period of time is about 15-30 seconds.

[c18] 18. The method of claim 16 wherein said second period of time is about 30-60 seconds.

[c19] 19. The method of claim 16 wherein said first predetermined period of time is 15-30 seconds; and said second predetermined period of time is 30-60 seconds.

[c20] 20. The method of claim 16 wherein said third predetermined period of time is about 75 seconds.

[c21] 21. The method of claim 20 wherein said first predetermined

period of time is about 20 seconds and said second predetermined period of time is about 40 seconds.

[c22] 22. The method of claim 16 wherein said first temperature is about 90Â°C and said second lower temperature is about 35Â°C to about 40Â°C.

[c23] 23. A method of operating an aluminum oxide moisture sensor to measure moisture in a sample gas, where the sensor comprises a pair of electrodes sandwiched about a dielectric, the method comprising:

a) drying the sensor during a first predetermined period of time to a moisture content level below the moisture content of the sample gas;

b) taking plural samples of sensor conductance over a second predetermined period of time at a temperature of about 35Â°C to about 45Â°C; and

c) determining a rate of adsorption of the moisture and using the rate of adsorption as a measure of moisture in the sample gas.